

CLAIMS

I claim:

[c1] An air duct for use with a portable power module trailerable over public roads, the portable power module including a container having an air inlet and housing a gaseous fuel motor drivably connected to an electrical power generator capable of producing at least approximately one megawatt of electrical power, the air duct comprising:

a body positionable adjacent to the air inlet on the container to at least partially define a first opening and a second opening, the first opening defining a first opening dimension and being parallel to a first direction and the second opening being at an angle to the first direction, the body further defining a first body dimension in the first direction and a second body dimension in a second direction that is at least substantially perpendicular to the first direction, the first body dimension being greater than the second body dimension.

[c2] The air duct of claim 1 wherein the second body dimension is less than the first opening dimension.

[c3] The air duct of claim 1 wherein the body is positionable inside the container.

[c4] The air duct of claim 1 wherein the second opening defined by the body of the air duct is perpendicular to the first direction.

[c5] The air duct of claim 1 wherein the first body dimension is between 3- 4 feet and the second body dimension is between 1-2 feet.

[c6] The air duct of claim 1 further comprising a flow splitter having an elongate cross-section longitudinally disposed parallel to the first direction adjacent to the second opening defined by the body of the air duct.

[c7] The air duct of claim 1 further comprising:
a flow splitter having an elongate cross-section longitudinally disposed parallel to the first direction adjacent to the second opening defined by the body of the air duct; and
acoustic insulation fixidly attached to the body.

[c8] The air duct of claim 1 wherein the body is positionable inside the container, wherein the second opening is perpendicular to the first direction, and wherein the air duct further comprises:

a flow splitter having an elongate cross-section longitudinally disposed parallel to the first direction adjacent to the second opening defined by the body of the air duct; and
acoustic insulation fixidly attached to the interior of the body of the air duct and to the flow splitter.

[c9] The air duct of claim 1 wherein a portion of ambient air flows into the container through the air duct, and wherein the portion of ambient air enters the air duct through the first opening and undergoes an approximate 90 degree change in direction before exiting the air duct into the container through the second opening.

[c10] A portable power module trailerable over public roads and capable of providing electrical power, the portable power module comprising:

a container having an air inlet;

a motor positioned within the container, the motor having a combustion air intake configured to receive combustion air from the air inlet;

an electrical generator positioned within the container and drivably connected to the motor to produce electrical power when driven by the motor at a selected speed, the generator having a generator air intake configured to receive cooling air from the air inlet; and

an air duct having a body positioned adjacent to the air inlet to at least partially define a first opening having a first opening dimension and a second opening, the first opening being parallel to a first direction and the second opening being at an angle to the first direction, the body further defining a first body dimension in the first direction and a second body dimension in a second direction that is at least substantially perpendicular to the first direction, the first body dimension being greater than the second body dimension and the second body dimension being less than the first opening dimension.

[c11] The portable power module of claim 10 wherein the air duct is an air inlet duct positioned inside the container.

[c12] The portable power module of claim 10 wherein the second opening defined by the body of the air duct is perpendicular to the first direction.

[c13] The portable power module of claim 10 wherein the first body dimension defined by the body of the air duct ranges from approximately 3 to 4

feet and the second body dimension defined by the body of the air duct ranges from approximately 1 to 2 feet.

[c14] The portable power module of claim 10 wherein the air duct further includes a flow splitter having an elongate cross-section longitudinally disposed parallel to the first direction adjacent to the second opening defined by the body of the air duct.

[c15] The portable power module of claim 10 wherein the air duct further includes:

a flow splitter having an elongate cross-section longitudinally disposed parallel to the first direction adjacent to the second opening defined by the body of the air duct; and
acoustic insulation fixidly attached to the body.

[c16] The portable power module of claim 10 wherein the air duct is an air inlet duct positioned inside the container, wherein the second opening defined by the body of the air duct is perpendicular to the first direction, and wherein the air duct further includes:

a flow splitter having an elongate cross-section longitudinally disposed parallel to the first direction adjacent to the second opening defined by the body of the air duct; and
acoustic insulation fixidly attached to the interior of the body of the air duct and to the flow splitter.

[c17] The portable power module of claim 10 wherein the air inlet is a first air inlet, wherein the container is a shipping container defining a first interior portion toward a third direction and a second interior portion toward a fourth

direction opposite to the third direction, wherein the motor is a gaseous fuel motor positioned within the first interior portion, the motor having a coolant jacket for circulating liquid coolant, wherein the electrical generator is positioned within the first interior portion and drivably connected to the motor to produce at least one megawatt of electrical power when driven by the motor at a selected speed, and wherein the portable power module further comprises:

- a radiator positioned within the second interior portion in flow communication with the coolant jacket, the radiator configured to receive the coolant from the coolant jacket and return the coolant to the coolant jacket;
- a first air circuit including the first air inlet positioned on the container adjacent to the first interior portion to provide an ambient first air portion to the first interior portion at least substantially to the exclusion of the second interior portion, the first air circuit further including a first air outlet positioned on the container to discharge at least a fraction of the first air portion away from the container; and
- a second air circuit including a second air inlet positioned on the container adjacent to the second interior portion to provide an ambient second air portion to the second interior portion at least substantially to the exclusion of the first interior portion, the second air circuit further including a second air outlet positioned on the container to discharge at least a fraction of the second air portion away from the container.

[c18] The portable power module of claim 17 wherein the container further includes a first side portion spaced apart from an opposing second side portion and a bottom portion spaced apart from an opposing top portion, the

bottom and top portions being connected to the first and second side portions, wherein:

the first air inlet is positioned adjacent to one of the first or second side portions;

the second air inlet is positioned adjacent to one of the first or second side portions;

the first air outlet is positioned adjacent to the top portion of the container to vertically discharge at least a fraction of the first air portion away from the container; and

the second air outlet is positioned adjacent to the top portion of the container to vertically discharge at least a fraction of the second air portion away from the container.

[c19] The portable power module of claim 17 wherein the first air portion provides ambient air to the combustion air intake and the generator air intake, and wherein the second air portion provides ambient air adjacent to the radiator to cool the coolant received from the coolant jacket.

[c20] The portable power module of claim 17 wherein the container further includes a first side portion spaced apart from an opposing second side portion and a bottom portion spaced apart from an opposing top portion, the bottom and top portions being connected to the first and second side portions, wherein the portable power module further comprises an exhaust gas silencer positioned within the container and having an exhaust gas outlet positioned adjacent to the top portion of the container, the exhaust gas silencer connected in flow communication with the combustion chamber and configured to receive exhaust gases from the combustion chamber and vertically discharge the exhaust gases through the exhaust gas outlet away from the container.

[c21] The portable power module of claim 17 further comprising:
a first air moving system, the first air moving system including a first fan positioned in flow communication with the first air outlet to move at least a fraction of the first air portion from the first interior portion through the first air outlet and away from the container; and
a second air moving system, the second air moving system including a second fan in flow communication with the second air outlet to move at least a fraction of the second air portion from the second interior portion, past the radiator, through the second air outlet and away from the container.

[c22] The portable power module of claim 17 wherein the container further includes a first side portion spaced apart from an opposing second side portion and a bottom portion spaced apart from an opposing top portion, the bottom and top portions being connected to the first and second side portions, wherein the first air outlet is positioned adjacent to the top portion of the container to vertically discharge at least a fraction of the first air portion away from the container, wherein the second air outlet is positioned adjacent to the top portion of the container to vertically discharge at least a fraction of the second air portion away from the container, and wherein the portable power module further comprises:

a first air moving system, the first air moving system including a first fan positioned in flow communication with the first air outlet to move at least a fraction of the first air portion from the first interior portion through the first air outlet and away from the container; and
a second air moving system, the second air moving system including a horizontally situated second fan in flow communication with the second air outlet to move at least a fraction of the second air

portion from the second interior portion, past the radiator, through the second air outlet and away from the container.

[c23] The portable power module of claim 17 wherein the container has an overall length dimension of about 40 feet or less, an overall width dimension of about 8 feet or less, and an overall height dimension of about 8.5 feet or less.

[c24] The portable power module of claim 17 wherein the combustion chamber is configured to combust a fuel mixture comprising natural gas.

[c25] The portable power module of claim 17 wherein the generator produces at least approximately one megawatt of electrical power ranging from approximately 50Hz to 60Hz when driven by the motor at a speed ranging from 1500 to 1800 RPM.

[c26] The portable power module of claim 17 further comprising a trailer supporting the container and its contents, the trailer having a tandem axle rear wheel-set and a forward coupling, the coupling being releasably attachable to a transport vehicle for movement of the portable power module over public roads.

[c27] A method for providing ambient air to a portable power module trailerable over public roads, the portable power module including a container having an air inlet and housing a motor drivably connected to an electrical generator for producing electrical power, the method comprising:

providing an air duct having a body defining a first body dimension in a first direction and a second body dimension in a second direction that is at least substantially perpendicular to the first direction, the

first body dimension being greater than the second body dimension;

positioning the air duct adjacent to the air inlet to at least partially define a first opening and a second opening, the first opening being parallel to a first direction and the second opening being at an angle to the first direction, the first opening defining an opening dimension that is less than the first body dimension;

flowing ambient air into the air duct through the first opening;

changing the direction of the ambient air from the second direction to the first direction; and

flowing the ambient air out of the air duct through the second opening.

[c28] The method of claim 27 wherein:

flowing the ambient air into the air duct includes flowing the ambient air into the air duct through the first opening in the second direction; and

flowing the ambient air out of the air duct includes flowing the ambient air out of the air duct through the second opening in the first direction.

[c29] The method of claim 27 wherein positioning the air duct adjacent to the air inlet includes positioning the air duct to at least partially define the second opening at a right angle to the first direction.

[c30] The method of claim 27 wherein positioning the air duct adjacent to the air inlet includes positioning the air duct inside the container.

[c31] The method of claim 27 further comprising:
affixing a flow splitter to the body of the air duct, the flow splitter having an elongate cross-section longitudinally disposed parallel to the first direction adjacent to the second opening; and
separating the ambient air into a first portion and a separate second portion, wherein flowing the ambient air out of the air duct includes flowing the first and second portions out of the air duct through the second opening.

[c32] The method of claim 27 further comprising:
affixing acoustic insulation to an interior portion of the body of the air duct;
affixing a flow splitter to the body of the air duct, the flow splitter having an elongate cross-section longitudinally disposed parallel to the first direction adjacent to the second opening; and
separating the ambient air into a first portion and a separate second portion, wherein flowing the ambient air out of the air duct includes flowing the first and second portions out of the air duct through the second opening.

[c33] The method of claim 27 wherein changing the direction of the ambient air from the second direction to the first direction includes changing the direction of the ambient air by approximately 90 degrees.

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